Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of fabricating a semiconductor device, using a plasma etching system including a vacuum chamber, a susceptor arranged in the vacuum chamber for mounting a semiconductor wafer, a gas introducing means for introducing a ~~material~~ gas to the vacuum chamber and a means for introducing high-frequency power, the method comprising the steps of:

producing plasma from [[a]] the gas introduced into the vacuum chamber ~~by the gas introducing means~~ using the high-frequency power;

forming a plurality of holes selectively on a ~~main~~ surface of the semiconductor wafer in an atmosphere of the plasma;

~~during or after the hole forming step,~~

irradiating [[the]] light having a continuous spectrum in a flat portion and a hole portion of the [[main]] surface of the semiconductor wafer; [[and]]

measuring a relation between a first reflectivity of the light and a first wavelength of the light for the flat portion, and a relation between a second reflectivity of the light and a second wavelength of the light for the hole portion respectively;

measuring the amount of shift ~~along the direction of the wavelength axis~~ between the first reflectivity ~~of detection light~~ for the flat portion and the second reflectivity ~~of detection light~~ for the hole portion with respect to the first and second wavelengths; and

calculating the depth of the hole portion based on the ~~wavelength axis direction~~ shift amount of the first and second reflectivity with respect to the first and second wavelength, film thickness data and hole pattern data.

2. (currently amended)A method for fabricating a semiconductor device as defined in Claim 1, wherein the light enters the [[main]] surface of the semiconductor wafer at right angles or diagonally thereto, and the first and second reflectivity is measured from the ratio of intensity between the incident light and the reflected light.

3. (canceled)

3 4. (currently amended)A method for fabricating a semiconductor device as defined in Claim 1, wherein the [[main]] surface of the semiconductor wafer has an interlayer insulating film, and the plurality of the holes are formed in the interlayer insulating film.

4 5. (currently amended) A method of fabricating a semiconductor device comprising:

(1) a step of forming an insulating film on the semiconductor substrate and a mask on the insulating film, the mask having a hole portion formed with a plurality of hole patterns and a flat portion not formed with a hole pattern;

(2) a step of forming a plurality of holes in the insulating film by dry etching based on the mask;

(3) a step of irradiating light having a continuous spectrum on a flat portion and a hole portion of the film, measuring ~~a change in the wavelength axis direction~~ a shift amount between ~~the~~ a first reflectivity of ~~detection~~ the light with respect to a first wavelength of the light in the flat portion and ~~the~~ a second reflectivity of ~~detection~~ the light with respect to a second wavelength of the light in the hole portion respectively and calculating the depth of the hole portion based on the measurement result thereby to control the operation to form a plurality of holes through the insulating film during the step of (2); and

(4) a step of burying a metal in the plurality of the holes of the hole portion.

6. (currently amended)A method for fabricating a semiconductor device as defined in Claim 5, wherein:

the light enters a [[main]] surface of a semiconductor wafer at right angles or diagonally thereto, and the first and second reflectivity is measured from the ratio of intensity between the incident light and the reflected light during the step (2).

7. (canceled)

8. (canceled)

9. (currently amended)A method for fabricating a semiconductor device as defined in Claim [[8]]5, wherein the light is incident on a [[main]] surface of a semiconductor wafer at right angles or diagonally thereto, and [[a]] the first and second reflectivity thereby is measured from the ratio of intensity between the incident light and its reflected light during the step (2).

10. (original) A method for fabricating a semiconductor device as defined in Claim 9, wherein the light is white light.

11. (currently amended)A method for fabricating a semiconductor device by preparing a plasma etching system including a vacuum chamber, a susceptor arranged in the vacuum chamber for installing a semiconductor wafer, a gas introducing means for introducing the ~~material~~ gas to the vacuum chamber and a high-frequency power introducing means, the method comprising the ~~step~~ steps of:

converting the gas to a plasma ~~gas~~ introduced into the vacuum chamber ~~by the gas introducing means~~ and forming a plurality of holes selectively on a ~~main~~ surface of the semiconductor wafer in a plasma atmosphere,

further preparing the plasma etching system by including a light source for radiating detection light, a detection system having a beam splitter arranged in a light path, a lens, a spectrometer and a diode array, an XY movable table movable in horizontal direction in the detection system and a computer for storing data of the detection system, and the detection light from the light source being radiated on the ~~main~~ surface of the semiconductor wafer through a quartz window formed in a ceiling portion of the vacuum chamber; and

the method further comprising a step of radiating the detection light from the light source in a flat portion and a hole portion of the ~~main~~ surface of the semiconductor wafer[[,]]; and

measuring the change [[in]] reflectivity with respect to wavelength between [[in]] the flat portion and the hole portion, and calculating the depth of the hole portion based on the shift amount of the reflectivity with respect to the wavelength, film thickness data and hole pattern data ~~during or after the step of forming the holes~~.

12. (canceled)

13. (canceled)

14. (canceled)

15. (canceled)

16. (currently amended) A method for fabricating a semiconductor device by preparing a plasma etching system including a vacuum chamber, a gas introducing means for introducing a gas to the vacuum chamber and a high-frequency power introducing means, the method comprising the step of converting, by the high-frequency power, to a plasma the gas introduced into the vacuum chamber by the

gas introducing means and forming a plurality of holes selectively on a main surface of a semiconductor wafer in a plasma atmosphere, wherein:

the plasma etching system includes an etching depth inspection unit having a first electrode arranged in contact with the semiconductor wafer and movable in a horizontal direction, a second electrode arranged in opposed relation to first electrode and movable in a vertical direction, an impedance meter electrically connected to first and second electrodes, and a computer electrically connected to the impedance meter through an A/D converter;

the method comprising a step of measuring an electrostatic capacitance of a flat portion and a hole portion of the wafer on the main surface of the semiconductor wafer by the etching depth inspection unit after forming the holes, and a step of comparing the electrostatic capacitance acquired from the flat portion and the hole portion with each other and determining the difference between a measurement value of the electrostatic capacitance of the flat portion and a measurement value of the electrostatic capacitance of the hole portion;

~~as defined in Claim 15,~~ further comprising a step of scanning the semiconductor wafer by the second electrode for measuring the hole portion, a scanning step determining the position of the second electrode in such a manner as to minimize the electrostatic capacitance.

17. (currently amended)A method for fabricating a semiconductor device as defined in Claim [[15]] 16, wherein the plasma etching system includes a load lock chamber and an unload lock chamber, and the first and second electrodes are arranged in the unload lock chamber.

18. (currently amended)A method for fabricating a semiconductor device as defined in Claim [[15]] 16, wherein a plurality of protruded electrodes in contact with the reverse surface of the semiconductor wafer are arranged on the first electrode.

19. (original) An apparatus for fabricating a semiconductor device as defined in Claim [[15]] 16, wherein the forward end portion of the second electrode constitutes a circular surface having a diameter of 0.1 mm to 3 mm.

20. (currently amended)A method for fabricating a semiconductor device as defined in Claim [[15]] 16, wherein the interval between the second electrode and the surface of the semiconductor wafer is between 0.1 μm and 50 μm.